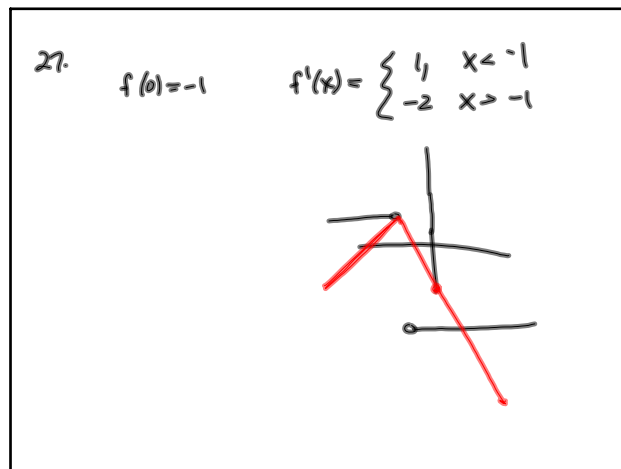
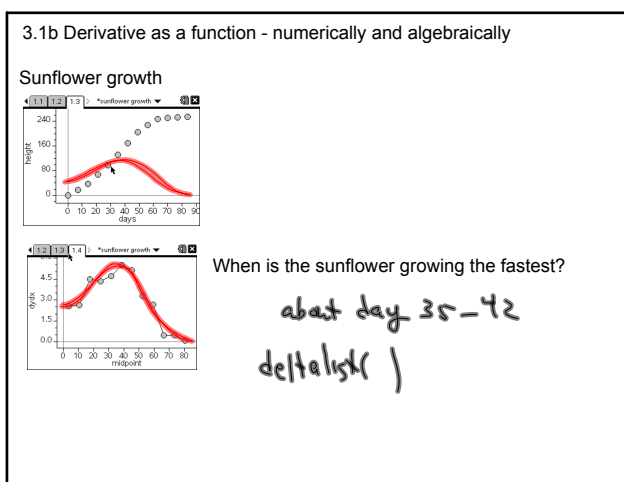


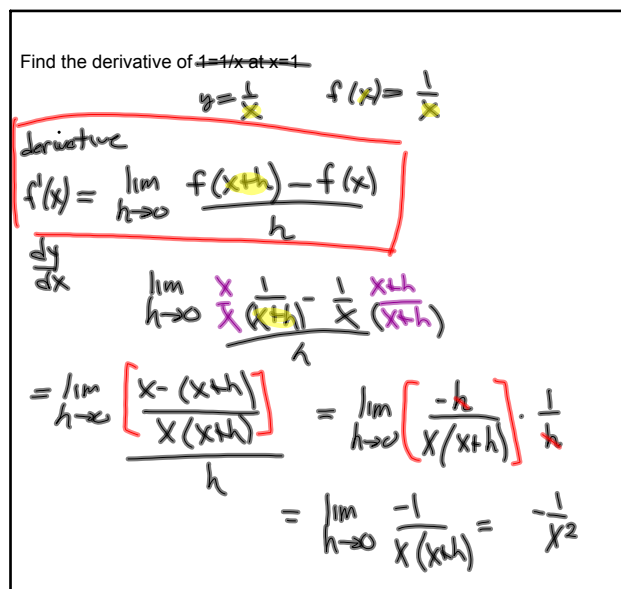
Sep 11-9:05 AM



Sep 11-9:11 AM



Sep 9-10:16 PM



Sep 9-10:41 PM

Find the derivative of  $f(x) = \sqrt{x+2}$  at  $x=7$

$$\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

conjugate

$$\lim_{h \rightarrow 0} \frac{(\sqrt{x+h+2} - \sqrt{x+2}) (\sqrt{x+h+2} + \sqrt{x+2})}{h (\sqrt{x+h+2} + \sqrt{x+2})}$$

$$\lim_{h \rightarrow 0} \frac{\cancel{h}(\cancel{x+h+2} - (\cancel{x+2}))}{\cancel{h}(\sqrt{x+h+2} + \sqrt{x+2})} = \lim_{h \rightarrow 0} \frac{1}{\sqrt{x+h+2} + \sqrt{x+2}}$$

$$f'(x) = \frac{1}{2\sqrt{x+2}}$$

$$f'(7) = \frac{1}{2\sqrt{7+2}} = \frac{1}{6}$$

One-sided derivatives

Show that the following function has a left hand and a right hand derivative at  $x=0$ , but no derivative there.

$$f(x) = \begin{cases} x^2 & x \leq 0 \\ 2x & x > 0 \end{cases}$$

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Sep 10-11:33 AM